DO CARIBBEAN SPONGES HAVE PHYSICAL DEFENSES ? *Memoirs of the Queensland Museum 44: 92. 1999*:- Sponges are conspicuous members of the Caribbean marine ecosystem, but are preyed upon by a very select group of consumers called spongivores. Like other sessile reef invertebrates such as ascidians and octocorals, sponges possess a variety of novel secondary metabolites and as well as mineral and organic skeletal components. Several studies have shown that sponges possess chemical defenses that inhibit feeding by browsing generalist fish, but no study to date has demonstrated that sponge skeletal components deter predation. Sponges are soft-bodied and seem to lack an obvious physical defense, such as a mineralized shell. However, the tissues of most sponges often contain a collagen-like substance called spongin and sharp siliceous spicules in high concentrations. Spicules serve as important structural components by increasing tissue rigidity and could potentially act as a defense by irritating the mouth parts and the digestive system of predators. Calcified structures, similar in size to spicules, from octocorals and algae have been shown to reduce feeding by fish and invertebrates. Surprisingly, field and laboratory aquarium assays of sponge spicules employing predatory reef fish did not support a defensive function. Consumption by reef fish was reduced only when spicules were assayed using foods of low nutritional quality. In assessing the chemical defenses of Caribbean sponges, 31% of the species we studied possessed organic extracts palatable to reef fish. Interestingly, many of these undefended sponge species are abundant and consumed only by spongivores. Sponges lacking a chemical defense may be protected from generalist predators by having tissues of low nutritional value. Protein, carbohydrate, lipid, ash, and caloric content of 71 Caribbean sponge species were measured to investigate the relationship between chemical defense and nutritional value. Except for lipid content, no significant differences in nutritional quality were found between chemically defended and undefended species. Sponges lacking a chemical defense may rely on tactics other than a physical or 'nutritional' defense, such as faster growth rates, to avoid predation by generalist consumers. ❐ *Porifera, chemical defenses, physical defenses, spicules, silica, nutritional quality, predatory-prey interactions, Caribbean reef ecosystems.*

Brian Chanas (email: chanas@niehs.nih.gov) & Joseph R. Pawlik, Biological Sciences, University of North Carolina at Wilmington, 601 S. College Road, Wilmington, North Carolina, USA, 28403-3297; *Present address: Laboratory of Pharmacology and Chemistry, National Institute of Environmental Health Sciences, MD C3-02, P.O. Box 12233, Research Triangle Park, North Carolina, 27709 USA;* *1 June 1998.*